

## CLAIMS

What is claimed is:

1. A method comprising:

5           receiving a byte value from a signaling channel;  
          locating a particular unused byte location within an overhead portion of a  
synchronous optical network (SONET) frame; and  
          inserting the byte value from the signaling channel into the particular unused  
byte location.

10           2. The method of claim 1 wherein the signaling channel comprises a control channel to  
define at least one of quality of service, authentication, provisioning, and billing  
parameters for one or more regional network services trunked to a SONET service  
comprising the SONET frame.

15           3. The method of claim 1 further comprising:

          receiving a plurality of additional byte values from the signaling channel;  
          locating a plurality of additional unused byte locations within the overhead  
portion of the SONET frame; and  
20           inserting the plurality of additional byte values into respective ones of the plurality  
of additional unused byte locations.

4. The method of claim 1 further comprising:

receiving a plurality of additional byte values from a plurality of additional signaling channels;

locating a plurality of additional unused byte locations within the overhead

5 portion of the SONET frame; and

inserting the plurality of additional byte values from the plurality of additional signaling channels into respective ones of the plurality of additional unused byte locations.

10 5. The method of claim 1 further comprising:

receiving a plurality of additional byte values from the signaling channel;

locating the particular unused byte location within the overhead portion of a plurality of additional SONET frames; and

15 inserting the plurality of additional byte values from the signaling channel into the particular unused byte location in respective ones of the plurality of additional SONET frames.

6. The method of claim 1 wherein locating the particular unused byte location is one of a static location procedure and a dynamic location procedure.

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7. The method of claim 1 wherein locating the particular unused byte location is programmable.

8. The method of claim 1 receiving the byte value comprises:

storing the byte value in one of a plurality of regions of a unified memory, each of the plurality of regions corresponding to one of a plurality of signaling channels including the signaling channel of the byte value; and

loading the byte value from the respective region of the unified memory into an interface buffer corresponding to the respective region as part of a burst operation in which a plurality of additional byte values from the respective region are also loaded into the interface buffer, said interface buffer being one of a plurality of interface buffers corresponding to the plurality of regions, each of the plurality of interface buffers being loaded by the burst operation in a cyclical manner from respective regions of the unified memory.

9. The method of claim 1 wherein locating the particular unused byte location comprises:

switching to an interface buffer storing the byte value when the particular unused byte location is available to be written, said interface buffer being one of a plurality of interface buffers corresponding to a plurality of signaling channels, said plurality of interface buffers being switched to match the plurality of signaling channels to corresponding byte locations at a data rate of a SONET service comprising the SONET frame.

10. The method of claim 1 wherein locating the particular unused byte location comprises:

identifying a particular row, column, and plane in the SONET frame.

5 11. The method of claim 10 wherein identifying the particular row, column, and plane is with respect to one of a boundary of the SONET frame and a boundary of a synchronous payload envelope (SPE) within the SONET frame.

10 12. The method of claim 1 wherein the unused byte location comprises a byte location in one of a section overhead portion of the SONET frame, a line overhead portion of the SONET frame, and a path overhead portion of a synchronous payload envelope (SPE) within the SONET frame.

15 13. A method comprising:

receiving a synchronous optical network (SONET) frame;  
locating a particular byte location within an overhead portion of the SONET frame that is unused for SONET purposes; and  
capturing a byte value from the particular byte location, said byte value comprising a signaling channel.

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14. A machine accessible medium having stored thereon machine executable instructions that when executed implement a method comprising:

receiving a byte value from a signaling channel;

locating a particular unused byte location within an overhead portion of a synchronous optical network (SONET) frame; and

inserting the byte value from the signaling channel into the particular unused byte location.

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15. A machine accessible medium having stored thereon machine executable instructions that when executed implement a method comprising:

receiving a synchronous optical network (SONET) frame;

10 locating a particular byte location within an overhead portion of the SONET frame that is unused for SONET purposes; and

capturing a byte value from the particular byte location, said byte value comprising a signaling channel.

16. An apparatus comprising:

15 insertion logic to receive a byte value from a signaling channel, locate a particular unused byte location within an overhead portion of a synchronous optical network (SONET) frame, and insert the byte value from the signaling channel into the particular unused byte location.

20 17. The apparatus of claim 18 further comprising:

a unified memory to store the byte value in one of a plurality of regions within the unified memory, each of the plurality of regions corresponding to one of a plurality of signaling channels including the signaling channel of the byte value; and

an interface buffer to couple the unified memory to the insertion logic, said interface buffer to be loaded with the byte value from the respective region of the unified memory.

18. The apparatus of claim 19 wherein the interface buffer is loaded as part of a burst operation in which a plurality of additional byte values from the respective region are also loaded into the interface buffer, said interface buffer being one of a plurality of interface buffers corresponding to the plurality of regions within the unified memory, each of the plurality of interface buffers being loaded by the burst operation in a cyclical manner from respective regions of the unified memory.

19. An apparatus comprising:

extraction logic to receive a synchronous optical network (SONET) frame, locate a particular byte location within an overhead portion of the SONET frame that is unused for SONET purposes, and capture a byte value from the particular byte location, said byte value comprising a signaling channel.